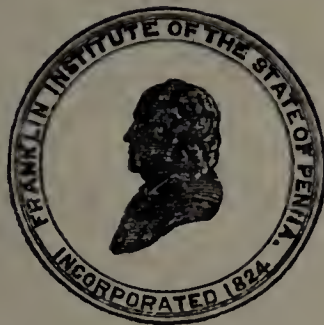


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THE CHESAPEAKE AND DELAWARE CANAL

By LEWIS M. HAUPT, A.M.; Sc.D.

Professor of Civil Engineering in the Franklin Institute.



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Mr. President and Members of the Institute:

The Franklin Institute as well as the various trade and commercial bodies of this city and of the nation have, for many years been importuning the General Government to extend the facilities for our internal commerce, over the waterways of the country, with but slight results. Other and far more potent influences have dominated legislation and retarded or prevented the passage of enabling acts to open, enlarge or emancipate our canal systems. A crisis has been reached and a return to the waterway is compulsory, because of its greater capacity and economy.

EARLY CANALS.

Three years after the inauguration of President Washington the first canal was built in the State of Massachusetts, at South Hadley, around the falls of the Connecticut River, which were fifty feet in height. It was two miles long, had five locks and passed through a cut forty feet in depth.

Among the earliest charters granted was that of the Dismal Swamp Canal, in Virginia, which was designed to be only 32 feet wide, and to float vessels of 3 feet draught, for the purpose of getting timber from the swamp. In 1816 the company was authorized to raise \$50,000 by lottery to enlarge the locks, which were 90x32x4 feet in dimensions.

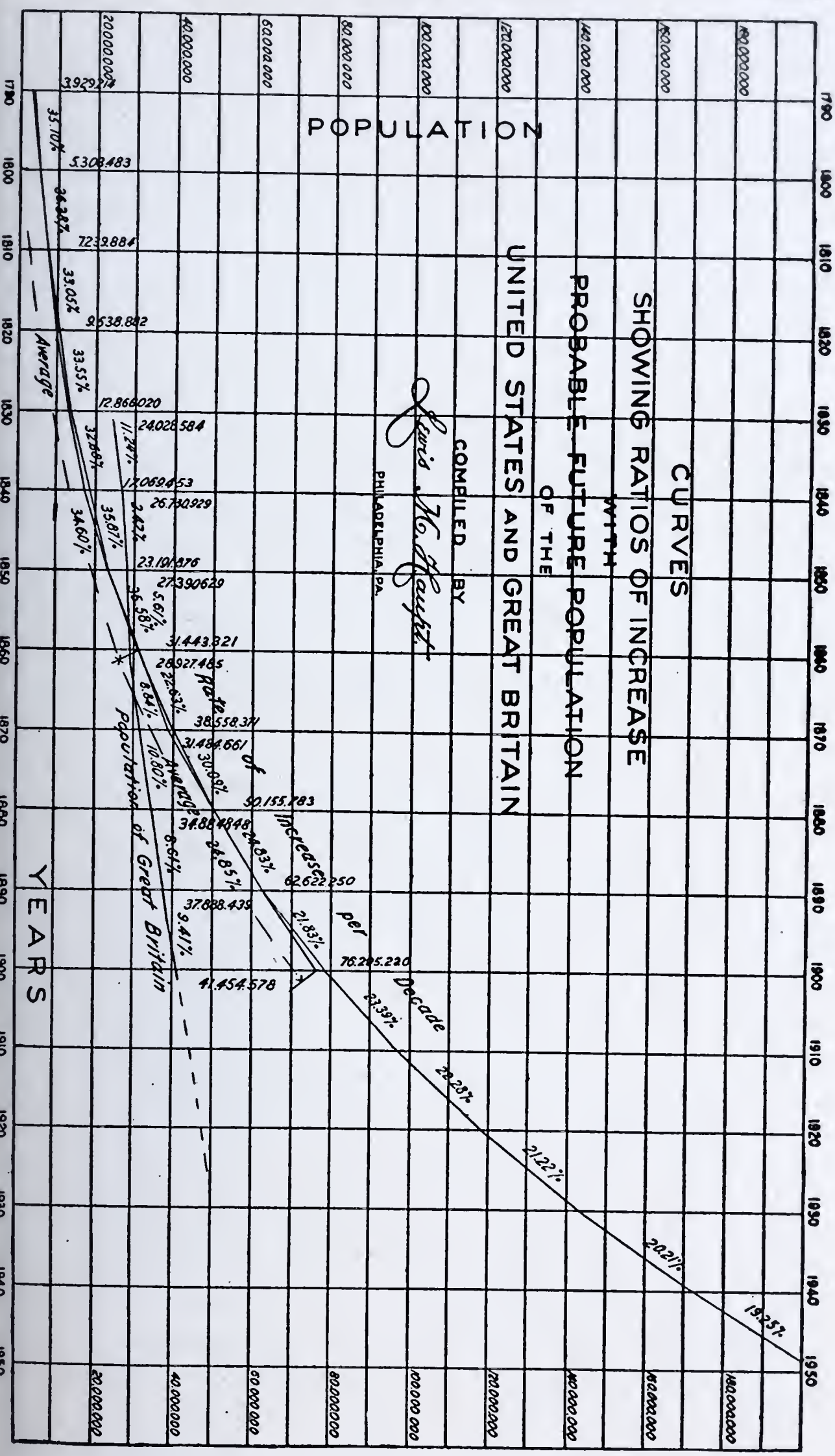
Similar recourse was authorized by the State of Pennsylvania to complete the work on the Union Canal, which was designed to connect Lake Erie with Tidewater, and after having contributed \$300,000 to the company the State, in 1821, guaranteed the interest and granted a monopoly of lotteries.

Thus sustained, work was resumed in 1821, and the link between the Susquehanna and the Schuylkill Rivers was completed in 1827, or 37 after its beginning and 65 years after the first survey.

These few facts are submitted to illustrate the difficulties encountered at the beginning of the canal epoch, when there were no avenues of communication save a few earth roads and the natural watercourses. During these forty years (1790-1830) the population, which is the basis of internal communications, increased from about 4,000,000 to nearly 13,000,000 and the canal mileage at the end of 1834 was reported to be 2617.89 miles.

CHEAP FUEL THE ISSUE.

The greatest economic stimulus was given to canals by the discovery of hard coal on the Mauch Chunk (Bear) Mountain, in 1792, by one Philip Ginter, who took a sample to Col. Jacob Weiss, and he, in turn, submitted it to Michael Hillegas, the first Treasurer of the United States, as well as to John Nicholson, and Chas. Cist, a printer, all of Philadelphia. About the beginning of 1792 these parties formed the "Lehigh Coal-Mine Company," and took up from 8,000 to 10,000 acres of



lands, but the difficulties of securing transportation compelled them to abandon their enterprise. At that time hard wood was selling in the city at \$13 per cord. It was found to cost \$13.50 to haul a "load" of coal by wagon from the quarry to Philadelphia, so that it could not compete profitably with hickory, and the Schuylkill and Lehigh Navigation Companies became a necessity. These canals, together with the Erie, the Chesapeake & Delaware, the Delaware & Hudson and many others were in operation by 1829.

THE RAILROAD EPOCH.

But canals could not be built where water was not available and the rapid increase and distribution of population, coupled with the invention of the locomotive gave a great impetus to the construction of railways, which have now become the dominant transportation interest in the country. From about 1,000 miles in 1835, they have expanded to 220,028.44 miles at the end of June, 1906. This is exclusive of sidings and yard trackage.

ENORMOUS POPULAR INVESTMENTS IN CORPORATE COMPANIES.

The total liabilities in bonds, stocks, &c., amount to \$16,219,573,845. The gross receipts to \$2,319,760,030, which is 14% of the capital. It represents the annual tolls for freight, express, passenger and other service paid by the patrons of the system. The total expenses for maintenance and operation are \$1,532,163,153, leaving 33% for the payment of interests, rents, taxes and dividends, so that there results an average dividend on this enormous capital of only about 3.65% on bonds and 3.02% on the capital stock. Some roads pay nothing. Those which pay the best are located along the water-courses where there is the cheapest kind of competition. Hence the development of waterways cannot injure the shareholders of railroad securities.

During the past year after paying 590 millions for betterments and 230 millions for dividends, the railroads had a credit balance of \$100,428,707.

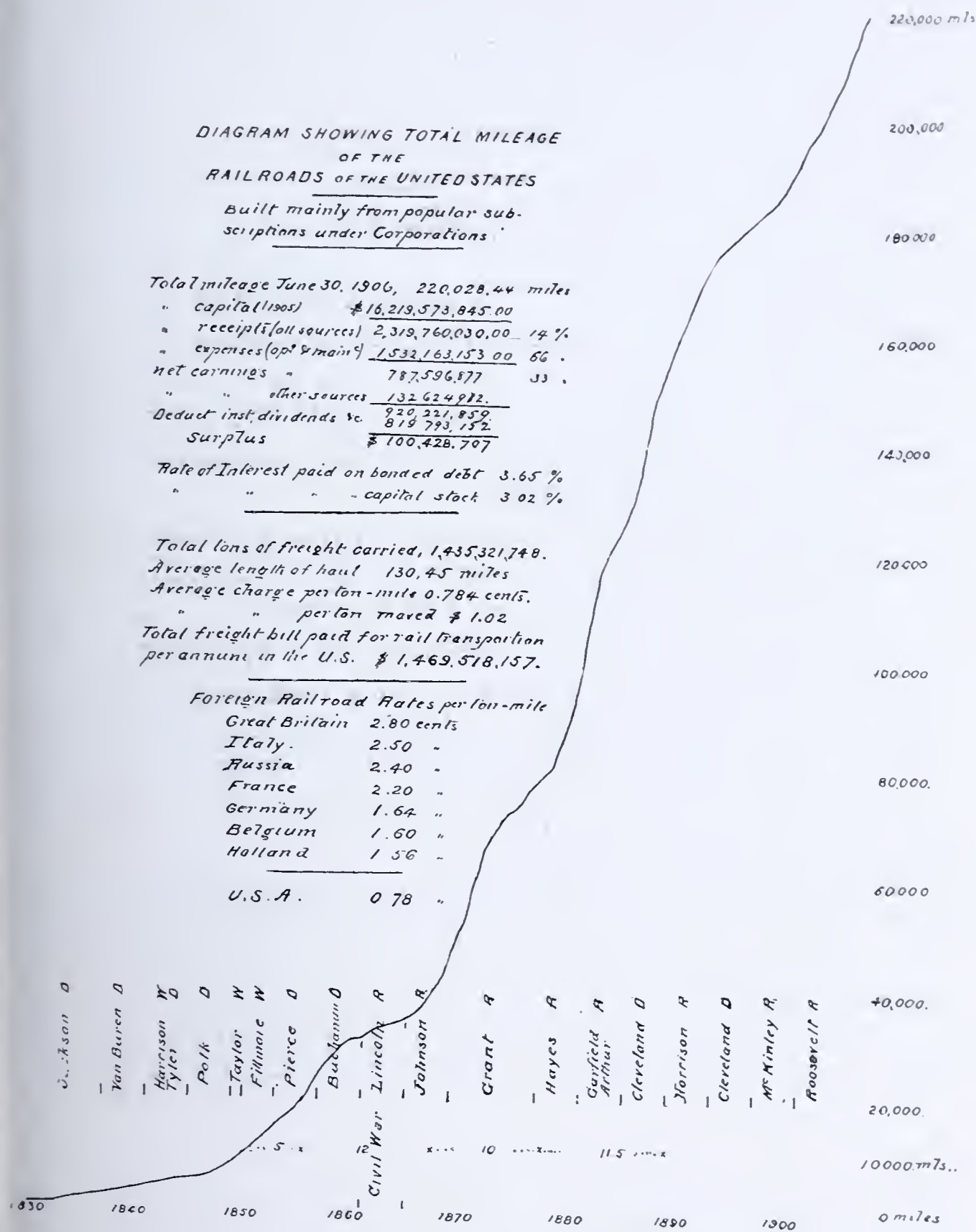
DIAGRAM SHOWING TOTAL MILEAGE
OF THE
RAILROADS OF THE UNITED STATES

Built mainly from popular sub-
scriptions under Corporations

Total mileage June 30, 1906,	220,028.44 miles
" capital (1905)	\$16,219,573,845.00
" receipts (all sources)	2,319,760,030.00 14 %
" expenses (op. & main)	1,532,163,153.00 66 .
net earnings	787,596,877 33 .
" " other sources	132,624,912.
Deduct inst. dividends &c.	920,221,859.
	819,793,152.
Surplus	\$100,428,707
Rate of Interest paid on bonded debt	3.65 %
" " " capital stock	3.02 %

Total tons of freight carried, 1,435,321,748.
Average length of haul 130.45 miles
Average charge per ton-mile 0.784 cents.
" " per ton moved \$ 1.02
Total freight bill paid for rail transportation
per annum in the U.S. \$ 1,469,518,157.

Foreign Railroad Rates per ton-mile	
Great Britain	2.80 cents
Italy.	2.50 "
Russia	2.40 "
France	2.20 "
Germany	1.64 "
Belgium	1.60 "
Holland	1.56 "
U.S.A.	0.78 "



L.H.H.
1906.

The total number of tons carried was 1,435,321,748,* and the average haul was only 130.45 miles. The average charge per ton-mile was 0.784 cents. This makes the average charge for each ton moved on the railroad \$1.02. This enormously potent system exists by virtue of the confidence which the people of the United States, aided also by foreign capital, have placed in the integrity of the masters of transportation, who have gradually consolidated the individual and disjointed enterprises into great trunk lines stretching across the continent.

Some of these lines were subsidized by the grants of extensive tracts of land or by loans from the public treasury, but the Government has entrusted their management and operation to the corporations who have developed or purchased the control, excepting in case of war, when some of them were seized temporarily for strategic purposes. That the policy of thus encouraging local, private and corporate initiative was wise, the results have amply proven.

It cannot be claimed that the low rates on American railroads are in consequence of improved water competition, since there is practically none, with the exception of the Great Lakes, where, although the rates are the lowest, the railroads receive a much greater revenue per mile than in any other portion of the country. In group II (New York to Md. inc.) the rate is 0.667 cents and the receipts from freight per mile is \$14,010, which is nearly double that of New England (I) and three times that of group IV.

On the other hand, the European railways, where there are well developed competing waterways, are enabled to charge from three to four times as much for an equivalent service. Thus in Great Britain the average charge is 2.2 cents; in Italy, 2.5; in Russia, it is 2.2; in France, 2.2; Germany, 1.64; Belgium, 1.60, and in Holland, 1.58, while at home it is only 0.78.

CONGESTION.

The curve of progress, in this matter of overland transportation, indicates that the end is not yet, but the experience of the past year serves to emphasize the fact that the railroads

*5150 square miles, one foot deep, when reduced to the shipping ton, or enough to blanket the entire State of Connecticut.

have limitations and that they are unable to handle the traffic in small units, especially where large quantities of low grade freights are required to keep the wheels of industry in motion, or even to provide the requisite amount of food and fuel to the populous centers.

That a crisis has been reached due to the failure of the carriers to handle the products of the soil and their inability to secure the necessary terminal facilities will be apparent from a few extracts taken from the daily press, as follows:—

“Orders have been issued by the N. Y. Central Lines west of Buffalo, instructing all agents to cease soliciting business, as the roads are unable to handle what comes to them naturally, but to spend their time in hunting up cars. * * * Never in the history of Western roads was the freight congestion so great as now. It was reported that the Northern Pacific road has at least 10,000 cars which it is unable to move.”

In Pittsburg the shortage of cars was recently reported to be 5000. Bradstreet says: “The really serious cause of complaint is the practically country-wide congestion in railway traffic which affects grain movement, collections and retail sales in the Northwest, delays delivery of badly needed coal supplies in the entire West, interferes with the movement of cotton to market in the South and hampers manufacturing operations in the iron and steel, textile, lumber and other trades.

An official of the Pennsylvania Railroad said: “It is almost impossible to say what car shortage exists on account of the daily increase in the amount of traffic. The demand for more cars comes from every part of our system. The general belief is that the business will increase during the next year.”

In the meantime the Interstate Commerce Commission is investigating the alleged car shortage and it is reported by Commissioner Lane that the agents in the Northwest state that the roads in the wheat belt are discriminating against grain and accepting other traffic. “ * * * There are millions of tons of freight awaiting shipment at the present time, which the railroads confess themselves unable properly to handle. Whether there is an actual car shortage or not is a question to be determined, but that there is fault to be found with the manner in which cars are used seems to be generally conceded by all traffic men.”

Later dispatches, dated from North Dakota, Dec. 16, report that “A frightful condition exists owing to scarcity of fuel. Several persons have frozen to death as a result of the railroads inability to furnish cars for the shipment of coal and wood. Two entire families perished. In scores of places no coal can be bought. Farmers are making no efforts to ship their wheat, which is left lying under the snow; the cry is for

fuel. Hay and straw are being burned, as well as fences and outbuildings, even the grain in the elevators is threatened, while the railroads and common roads are blocked with snow."

Dec. 17.—Nebraska towns are out of fuel and the price has risen to \$18 and \$20 a ton. In Western Kentucky there is a coal famine, and oil is scarce in Phoenix, Arizona, so that the electric and gas companies have been shut down.

The Interstate Railroad Commission is startled at the reports which are coming in from the West.

To meet this condition some roads are placing millions of dollars in additional rolling stock, and heavier locomotives, but after all, it comes back to the inadequate facilities for unloading these units at the terminals. President Hill, of the Great Northern Railroad, has very truly said that "To-day the entire country is suffering from want of transportation facilities to move its business without unreasonable delay. The prevailing idea with the public is that the railways are short of cars, while the facts are that the shortage is in the tracks and terminals to provide a greater opportunity for the movement of the cars."

Hence to increase cars without a corresponding increase in yards and storage capacity, merely aggravates the evil and increases the cost. In fact, a recent report of one of our trunk lines stated that its operating expenses had been increased 25% in the year because of the lack of facilities, and the difficulty of securing them is rapidly increasing. It is admitted that suitable terminals cannot be had in the vicinity of New York harbor to-day for \$150,000,000.

COLD AND FAMINE.

Thus while our surplus food supplies are bottled up on the farm, there comes a far cry from the older civilizations, of distress, poverty, and crime, terminating in death, because of the absence of food.

Twenty millions of Russians affected by famine and parents selling their *daughters* to Mohammedans for \$50 for the worst kind of servitude. Children whose ages range from 12 to 17 years are thus sold for food. The "hunger typhus" fever, resulting from starvation, is epidemic in Kazan.

Fifteen millions of Chinese are reported to be suffering from flood, fever and famine.

A CHANGE OF POLICY DEMANDED.

The remedy for these economic and social problems involves a radical change of policy. The railroads have in the past absorbed many of the canals and waterways which were regarded as dangerous rivals and have undertaken to handle the crude, freights of low value, by mechanical devices, involving at least three times the cost of the water-borne traffic. They have leased canals, at high rates of interest, merely to keep the traffic on the rails and have compelled manufacturers to pay much higher rates for coal, ores, lumber and other materials.

It would seem that the time had arrived when the traffic should be segregated to the cheapest, most capacious and quickest conveyors for the bulky materials, that the higher class freights may have the right-of-way and there may be less congestion in the yards and terminals. To this end all through freights for export or coastwise delivery, should be shipped at the nearest tidewater terminals and not be hauled into the great cities at all where the miles of cars greatly add to the dangers and delays of municipal traffic.

Thus the neglected condition of our internal and coastwise waterways is being forced upon the attention of the public as a necessary aid to the traffic of the country. Although about \$400,000,000 have been expended upon these works since 1822 by the Government, the projects already approved by Congress, are estimated to cost over \$400,000,000 more to meet the demands of the present day, and it is now difficult to secure the passage of a River and Harbor bill, even every three years. Legislation is blocked so subtly that it is next to impossible to prevent it. Some of the most important measures for the opening of the rivers and canals of the country, even where no expense is involved, are delayed for a score or more of years. Yet the plea is made that the funds can be applied to better advantage than for internal commerce. In this great and prosperous country, committed to the policy of arbitration and deriving all its revenues from the avocations of peace, the demand arises continually for over seventy per cent. of the total appropriations for destruction and waste, while a mere bagatelle is applied to construction and economy, the administrative, judicial and legislative de-

partment. Is this good business? If not, then it is neither good policy nor good government.

THE NAVAL BUDGET.

In a recent dispatch from Washington to the press it was stated that the nation expends over \$100,000,000 annually for a navy which is in a low state of efficiency and that the officers are too old, as well as the vessels, while one of the "ancient," and hence experienced, mariners in a public address, delivered not long since, admitted that the battleships were obsolete and the cruisers of little use. Another officer says that the life of the heavy guns is limited to about sixty rounds, which could be fired in an hour and a half, so that a new system of guns and of firing them is recommended. In the meantime it is reported that the situation in Japan is becoming threatening over the inability or unwillingness of this country to educate the Japanese children in the schools of the Pacific Coast, and that the Philippines and Hawaii, as well as the Pacific seaboard need to be protected by larger fleets, and the Panama Canal to be pushed rapidly to completion so as to be ready for any emergencies. Which means larger appropriations for these great floating war engines, which may be scuttled in a moment by a stray shot or uncharted rock.

There are some striking figures in the bulletin just issued from the Treasury Department for the expenses of the coming year, as follows:—

Out of a total approaching 700,000,000 dollars there is to be applied to Government expenditures (Legislative, Executive Judicial and Foreign intercourse) nearly \$40,000,000; to Miscellaneous and Permanent appropriations, \$209,000,000, and to Public Works, \$95,000,000. On the other hand, for the elements of war and its concomitant evils there are the items of

War	\$ 79,950,102
Navy	115,444,950
Indians	7,970,160
Pension	138,243,000

Making a total of.....\$341,608,212

Agriculture and Internal Commerce, which are the chief

sources of the wealth and revenue, have the smallest appropriations, and they are the most uncertain and difficult to secure.

Under these conditions, therefore, it is manifest that the country cannot expect any very rapid development to result from the exercise of its jurisdiction over the waterways, and this obstructive system of governmental control and patronage stands out in glaring contrast with the enormous expansion of the less profitable rail transportation, now so generally useful, but already outgrown by the productive industries of the nation, which demand greater relief.

A MANIFEST REMEDY.

The remedy must lie in the return to the ante-bellum policy of permitting any section, State or corporation to undertake its own improvements, whenever there is an apparent need. In many instances this would have been done had it not been necessary first to secure a special act from Congress. The greatest and most beneficent canal in the world to-day as to tonnage was opposed by the Government in 1839, when the State of Michigan had provided the means to dig a canal around the falls of the Sault Ste Marie, but the United States declined to grant a right-of-way through its military reservation. This opposition of the military arm continued until 1852, when the State finally undertook the work, and subsequently, after its utility was demonstrated, conveyed it to the Government.

THE KEYSTONE OF THE COASTWISE SYSTEM.

Many other instances might be cited of works which have been retarded for a generation, but suffice it to refer to the case of the Chesapeake & Delaware Canal, the enlargement of which was urged by a Convention, held in Baltimore as early as 1871, when it was recommended that, "If found to be practicable, desirable and valuable to the great interest of the country, that the said ship canal be constructed."

On the 11th of March, 1872, the House of Representatives called on the Secretary of War for a report on this project, but it was not until 1878 that an appropriation was made for the surveys upon which to base an opinion. Preliminary surveys

were made in 1879, accompanied by a report covering the lower routes and requiring further examinations into those at the northern end of the Peninsula, where it was narrowest. These were made and a report submitted in 1883, recommending that a mixed commission should be appointed "to consider and to report its opinion as to which of the various routes surveyed will afford the greatest protection in case of war, and the greatest facilities to commerce."

In 1894, eleven years later, such a commission was appointed and submitted its report to the effect that "THIS BOARD DETERMINES THE MOST FEASIBLE ROUTE FOR THE CONSTRUC-



The "Deep cut," looking east (3 miles).

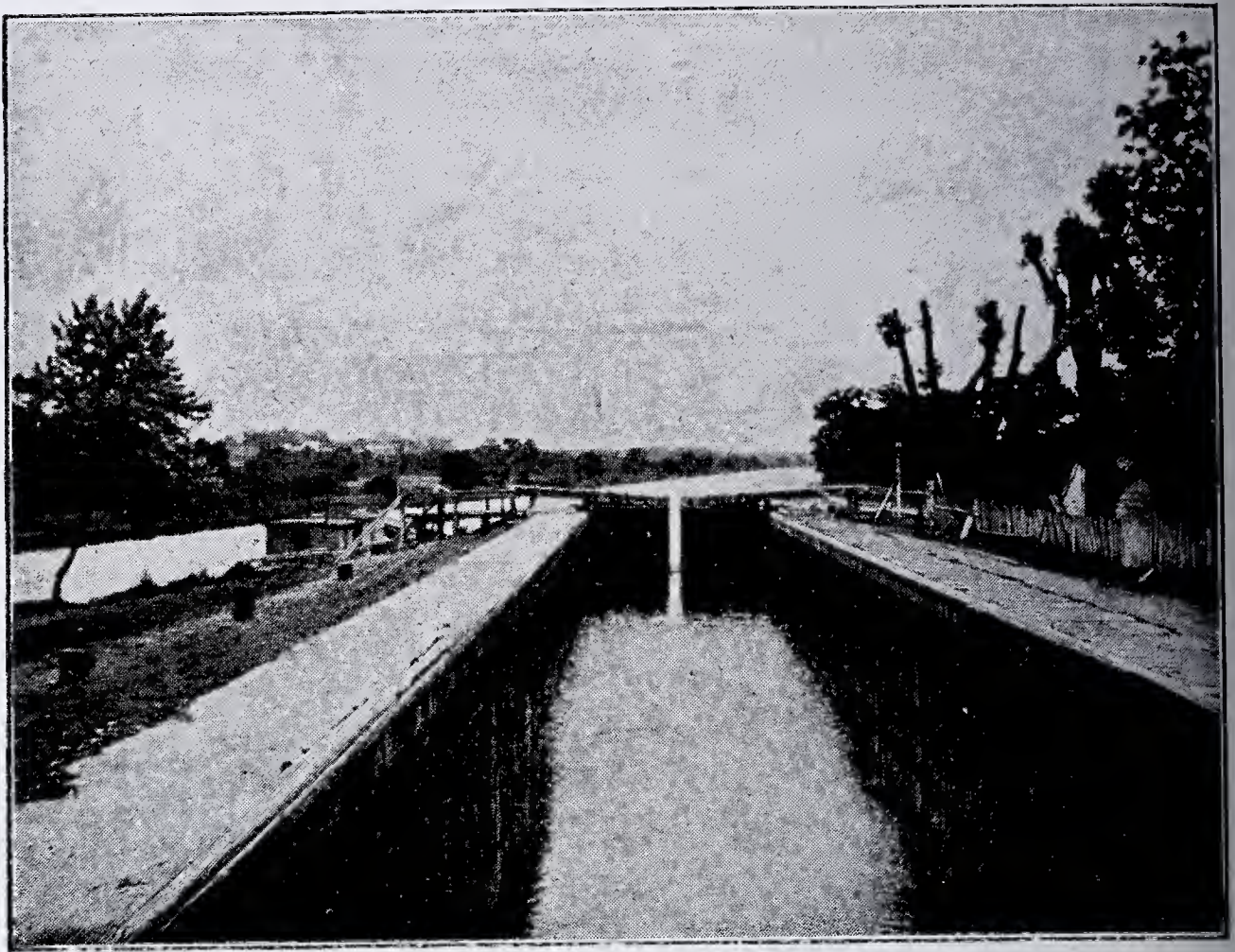
TION OF THE CHESAPEAKE AND DELAWARE CANAL TO BE THE BACK CREEK ROUTE, WHICH IS SUBSTANTIALLY LOCATED UPON THE LINE OF THE EXISTING CHESAPEAKE AND DELAWARE CANAL. THIS ROUTE WILL BE BEST ADAPTED FOR NATIONAL DEFENSE AND WILL GIVE THE GREATEST FACILITY TO COMMERCE." So that after twenty-three years the Memorial of the National Commercial Convention was at length answered, and the best route was determined upon, but again local in-

terests intervened to prevent further progress for a period of twelve more years, resulting in the appointment of another mixed commission to pass upon the findings of the former board as to the relative advantages of the two most northerly routes. However emphatically it may endorse the findings of its predecessors it is feared that in view of the shortness of the session (1906-7) no definite action may be taken, as the River and Harbor bill is practically completed and will carry an exceptionally large aggregate, but it is doubtful if any item on the bill would be of greater general benefit to the entire country, as a measure of peace or war, than one authorizing the immediate construction of an open, capacious and free canal across the neck of the Chesapeake and Delaware Peninsula on the best practicable route, and making an appropriation therefor.

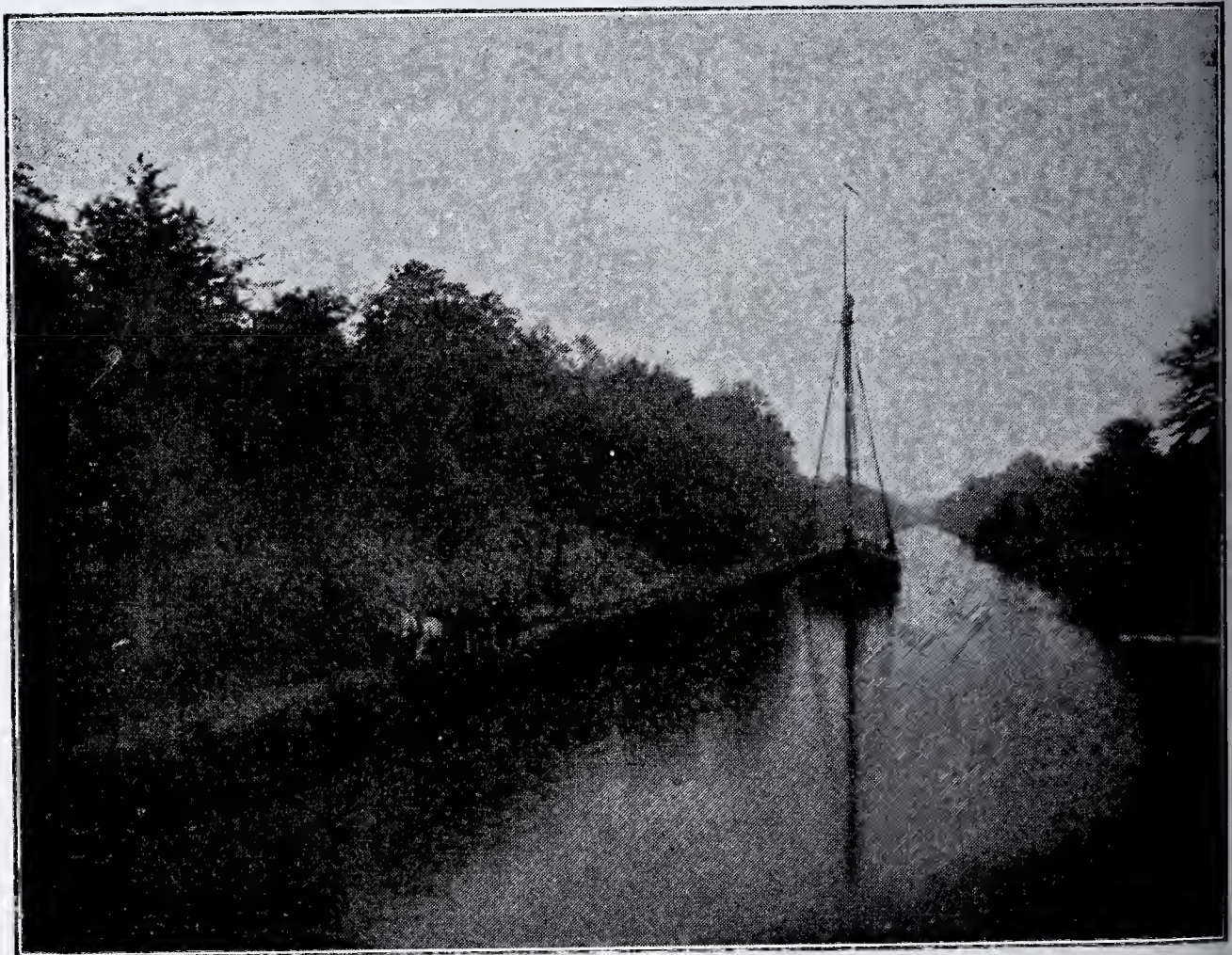
The basis for this confident assertion will be seen from the following extracts presented by the Trades League of Philadelphia to the Chesapeake and Delaware Canal Commission (of which General Felix Agnus is the Chairman, and Major C. A. F. Flagler, U. S. A., and Lieutenant Frank Chambers, U. S. N., are members,) at a hearing held in the Bourse, on the 27th day of September, 1906, when the following argument, in part, was respectfully submitted:—

ARGUMENT OF THE TRADES LEAGUE OF PHILADELPHIA.

1. The Chesapeake and Delaware Canal is a vital factor in coast defense, which may be secured for less than the price of one battleship, while it would at least double the efficiency of an entire fleet.
2. The absence of this connection between these two arms of the sea, during the War of 1812, cost the Government its National Capital and many valuable records, worth far more than the estimated cost of the proposed enlargement, (\$8,000,000).
3. The existence of the present restricted waterway, opened in 1829, saved the National Capital during the Civil War, when the overland communications were interrupted.
4. The high tariffs consequent upon its limited size, are a serious embargo upon interstate commerce, since it can pass



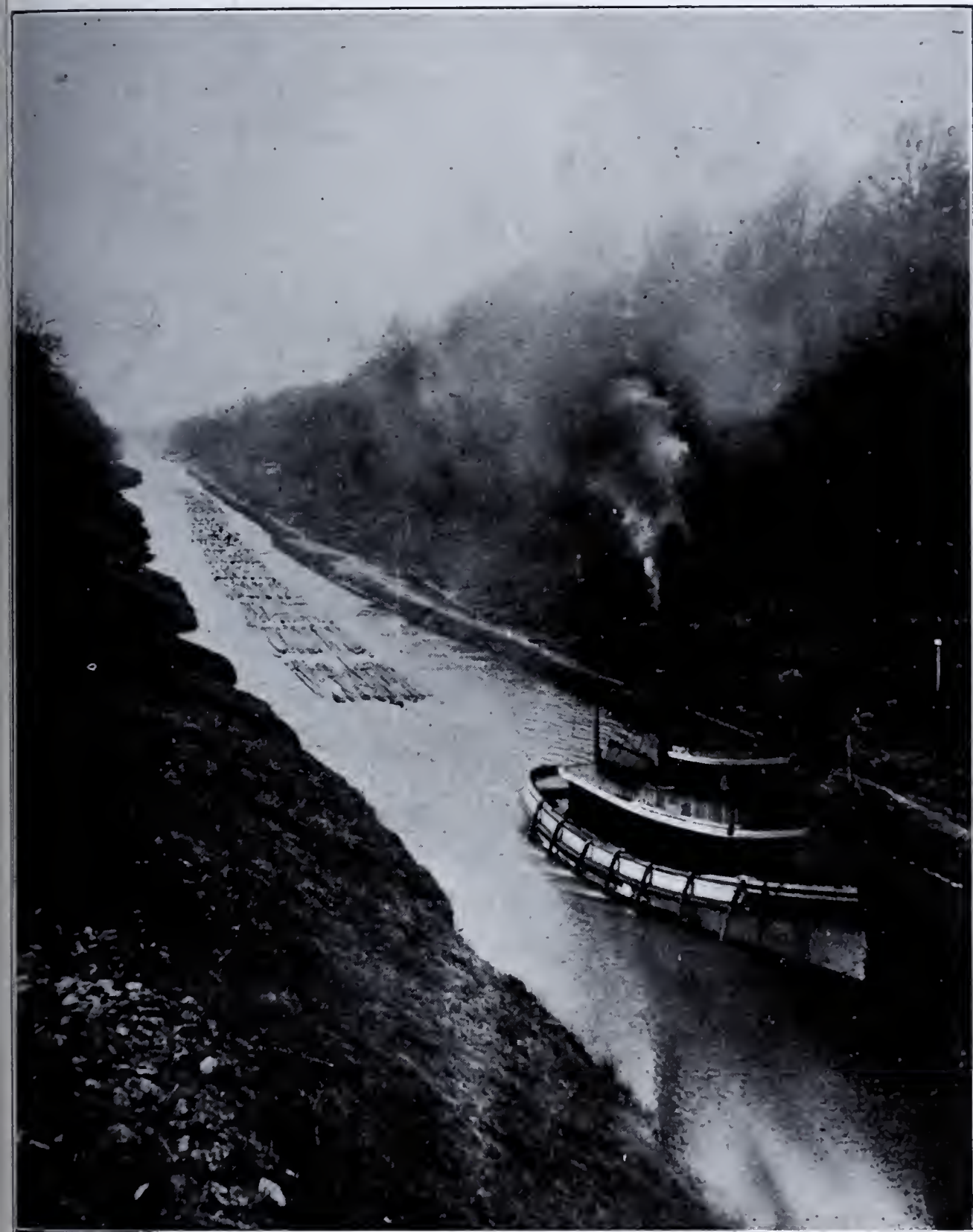
St. George's Lock (lower gates opening), only 220 feet long, 24 feet wide and 10 feet deep.



Towing lumber schooner by mule team.

arely three per cent. of the coastwise vessels, which have outgrown its antiquated dimensions.

5. The economies effected by the enlarged canal would



Towing 600-foot raft through "Deep Cut."

over the cost of the work in a very few years, while such a canal would also operate as an efficient natural rate regulator and at the same time develop a very much larger tonnage of higher class freights for the overland carriers, thus adding

largely to their revenues. This paradoxical result has been demonstrated fully by all the great canals and cheapest waterways in the world.

6. There is a greater amount of tonnage in sight to-day (50,000,000 tons), on these two bays and their tributary waters, than now traverses any of the great canals of the world. Nearly all of this is compelled to round the capes at great expense and risk.

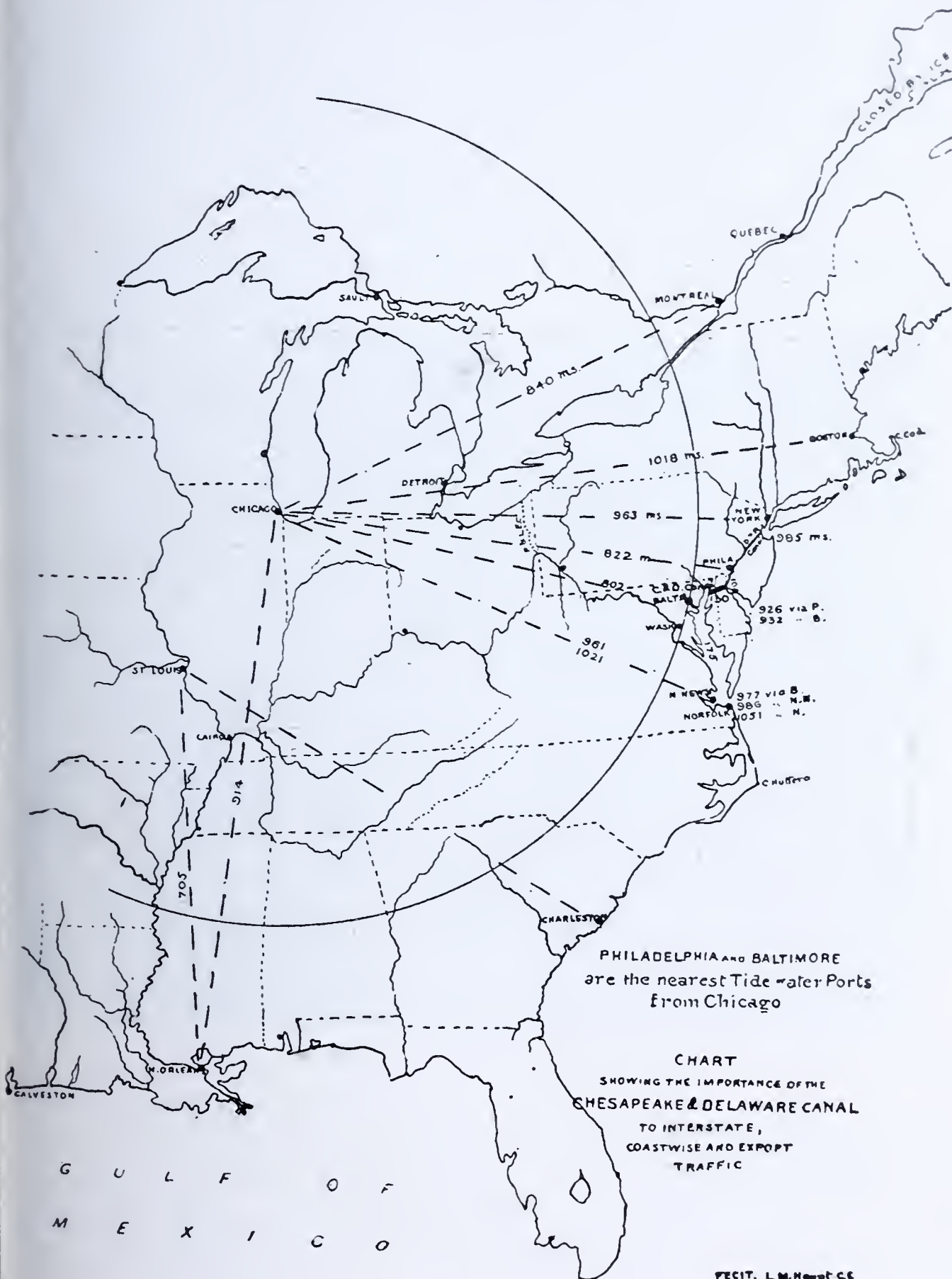
7. Industries and manufactures from New England to the Gulf of Mexico would be benefitted by the larger and cheaper shipments of fuel from the Cumberland and West Virginia fields, made through the Bay ports, if this canal was made large enough to pass ocean barges.

8. The differentials and exceptional facilities enjoyed by the Port of Baltimore, will attract the trade of the great West and draw vessels in ballast from northern ports through this short canal to that harbor.

9. The great necessity for this waterway has been under consideration for more than a century and its enlargement has been vigorously urged by commercial and trade bodies, by scientific and learned societies, by national boards and conventions and by officers and boards of the Army and Navy for many years.

10. Its superior geographical position and physical advantages have been attested by the unanimous reports of the many boards of engineers, both mixed and military, which have reported on the various solutions of this much mooted problem, and the conclusion has been reached, that, all things considered, the route which lies in the track of coastwise commerce and within the range of the defense is the best.

11. It has apparently not gotten beyond the stage of good resolutions, surveys and reports, by Congress, because of the excessive demand for National appropriations for other and less profitable purposes; yet it would seem from the above considerations, that there is no possible improvement, within the Federal domain, which would be more beneficial to a larger number of interests, both in peace and war, at so small an outlay as this; and as a business proposition it has no parallel, either in utility or economy, in any part of the globe, cost alone considered.



12. The U. S. Engineer's estimate of 1883 for the Chesapeake and Delaware route, of \$7,605,471, is composed of two parts, of which \$4,388,797 is for the canal proper and the balance \$3,216,674 is for the approaches, which are beyond the jurisdiction of the canal company, so that it has been unwilling to expend a large sum to increase the capacity of its portion of the waterway without first securing some assurance of co-operation on the part of the Government to the approaches.

13. In brief, the Chesapeake and Delaware Canal Route is the shortest, cheapest, most navigable, least obstructed by ice



Towing coal barge to Baltimore

or bridges, most practicable to maintain and is immediately available for traffic.

Why should the Government expend on other routes many millions more than it would cost to enlarge the Chesapeake and Delaware Canal, with its superior advantages, and thus destroy the value of the property in which it is a large joint owner ?

In further elaboration of the condensed theses giving reasons why the present Chesapeake and Delaware route was the

better, some illustrations from the history of the country were cited as to the effects due to the absence of such a water communication during the War of 1812, and the benefits derived from its existence during the Civil War, as follows:

It is well known that our Atlantic and Gulf coast cities are within easy steaming range of the foreign naval bases at Halifax, Bermuda, Kingston, Saint Lucia, and other places, and that the most vulnerable points of our seaboard are the various bays and sounds which indent the coast. To protect these



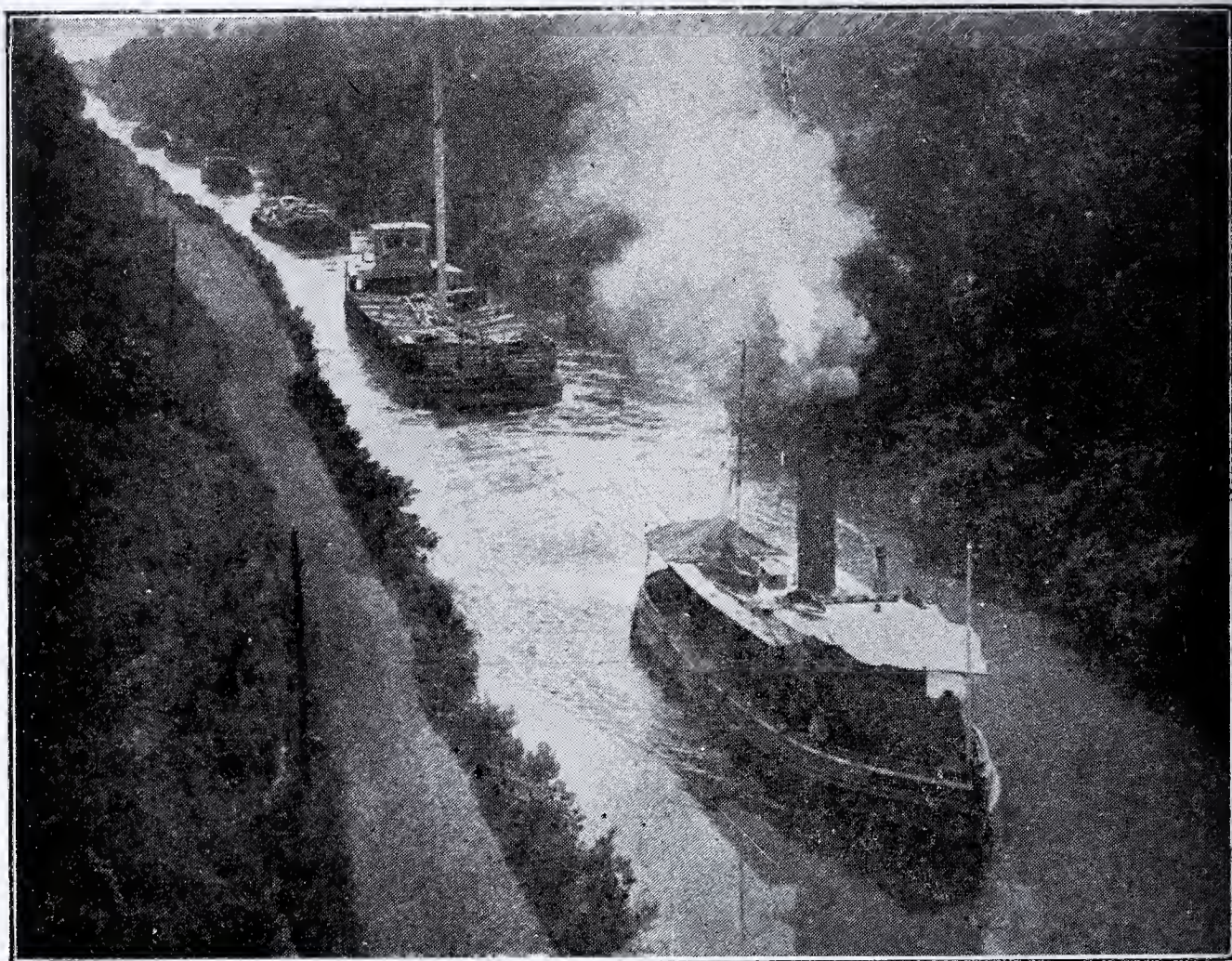
Delaware R. R. drawbridge

efficiently, a very large navy is necessary unless we can operate upon interior short bases.

In 1812 the British fleet forced the "*Constellation*" to take refuge in Norfolk harbor, where she remained during the war. The mouth of the Delaware was blockaded by three vessels, while four more of the enemies ships cut off the coast trade between New England and the Southern States. The lights were extinguished and the people of the coast realized their defenseless position. The Eastern Shore was pillaged by Admiral Warren, while Cockburn attacked and burned the villages

at the head of the Chesapeake Bay and destroyed Cecil Furnace where our guns were cast. Norfolk and Hampton were also attacked and the cities of Richmond and Washington threatened.

In the North the "*Decatur*" was penned in New York harbor, and by September, 1814, all of Maine east of the Penobscot had been captured and annexed to New Brunswick. Nantucket, reduced to famine, capitulated to remain neutral, if given clothes and provisions. Castine, Belfast, Hampden,



Towing five barges of cross-ties for P. R. R.

Machias and Bangor yielded to a superior force. Many towns paid a ransom. Stonington was destroyed and New England was greatly alarmed, and ready to secede. Cockburn and Lord Ross then returned to the Chesapeake and on the 24th day of August, 1814, destroyed the National Capital and many of its records by fire.

Our thousands of coasters and ten thousands of sailors were driven from the seas, and the coastwise traffic was forced to take the inland route over mud roads in the so-called "schooners," of which there were about 4,000 by the end of the

war. When the roads were passable it required 26 days to cover the distance from Boston to Baltimore and 33 days more to Augusta, Ga., making two months in all. Provisions rapidly rose in price, money became extremely scarce, the National Bank failed, and the country was in desperate strait when the news was received of the signing of the Treaty of Ghent. These events served to impress upon the country the necessity of connecting our coastwise waterways by navigable canals and led to the completion of the Chesapeake and Delaware Canal as the greatest and best work of the times. Its enlargement is even more necessary to-day to meet the urgent demands of coastwise commerce and national defense.

In 1892 General Craighill, ex-Chief of Engineers, wrote: "If a connection be made between the two bays north of Baltimore, it would be much better to have it by an enlargement of the existing canal, to the construction of which the United States has already contributed, rather than to open a parallel to it so near as the Sassafras route, which has been strongly advocated by others interested in it."

Still later, in 1898, he wrote: "My opinion is very decided that the system of coastwise canals should be enlarged so as to be available for use by the Navy and vessels of commerce, especially in time of war, and for this and other reasons, should be controlled by the United States." Thus this distinguished officer urged the enlargement and emancipation of this particular canal for commerce and national defense. Is it necessary for this nation to engage in a war to convince Congress of the necessity of enlarging and emancipating our interstate channels from tolls in behalf of commerce, domestic trade and rate regulation?

Again the city of Baltimore took official action by the passage of a resolution, March 17th, 1894, calling upon the Engineer of its Harbor Board for a report upon the Maryland and Delaware Ship Canal, which he submitted on the 26th of the same month, and in which he states, *inter alia*, "Studies have reduced the available routes to three. * * * As the same advantages and disadvantages pertain to each of the northern routes, it would appear that if either be adopted it should be the less costly. * * * The importance of a shorter route to the ocean for the coastwise and trans-Atlantic

commerce of Baltimore is too obvious to require argument; it is also of importance in an equal degree to the large territories of the Northwest, which find here the nearest point for the shipment of their products to Europe."

As a practical illustration of the great utility of the existing canal to the port of Baltimore for northern commerce, the statement of the agent of the New York and Baltimore Transportation Line is quite pertinent, since this company ran two lines of boats to New York, one via the canal and Delaware River rounding Cape May, and the other via Chesapeake Bay rounding Cape Charles. It was found that the time required by the canal route was only half that taken by the bay boats.* Another remarkable fact is stated to be the detention from ice which is actually found to give more trouble to the fleet using the lower bay route than to that using the canal. This opinion is based upon the use of the canal by that company for fifty years, and hence the agent of that line claims that "it is worth something."

The attitude of the far-sighted, patriotic and progressive citizens of Baltimore is further shown by the interest manifested in the project by the former President and Receiver of the Baltimore & Ohio R. R., Mr. John K. Cowen, who before investigation thought that the Sassafra route was the best, but after a careful personal investigation he went before the Congressional Committee and urged the enlargement of the Chesapeake and Delaware route, as being the most advantageous for the interests of the country served by his line, as well as for Baltimore. He distinctly stated that with this present canal enlarged and made free his company would ship its New England coal from the Port of Baltimore and in that event the railroad could haul as much in one car as now required two and a half. And, he added:

"I thought the Casey Board, in recommending the Chesapeake and Delaware Canal route, had overlooked the very largest item of coastwise commerce that would pass through the ship canal. I am prepared to say that directly from the Baltimore and Ohio Railroad at least two million tons of coal destined to New England ports, would pass through it, that this

*See Ex. Doc. 102 53d Cong. 2d Sess. H. R., p. 105.

tonnage would probably increase until it more than doubled the two million figure, and further, that coal to the extent of a million tons, now going via rail to New York harbor, would probably go in vessels via the canal instead."

This was in January, 1901. Thus more than 5,000,000 tons of coal would be distributed at a saving of over a dollar a ton if the canal were enlarged as desired by the consumers and manufacturers of the country. This great economy of \$5,000,000, on one item of commerce, would justify an expenditure of



Ericsson line steamer, passenger and freight. Daily trips, Baltimore-Philadelphia.

\$100,000,000 if capitalized at 5 per cent. The existing canal is an insuperable barrier to vessels requiring more than ten feet of water, and commerce importunes Congress for its removal.

FACILITIES FOR CONSTRUCTION.

Although this canal is but $13\frac{5}{8}$ miles in length, only one-fourth of this distance involves any considerable amount of work, as the route occupies the bed of several creeks and it is only necessary to pump the mud from the bottom over the

dike which forms the tow-path and fill up the swampy reaches, thus converting them into arable lands or commercial frontages. The "deep-cut," which is a little over three miles long, and seventy-six feet deep at the summit, was excavated in 1826-9 by hand labor, and gave some trouble until the slopes had assumed a condition of equilibrium, but for the past 20 years or more there has been no difficulty in maintaining the full depth of the channel. During the past 25 months the average dredging done to remove the wash from the steamers was but 28 cubic yards per diem in this cut.



Common road swing bridge, Delaware City.

Borings made under the several surveys have revealed no rock in place and the existence of the waterway enables the work to be attacked at any point by hydraulic dredges and thus reduces greatly the cost of the enlargement, as well as the time for completion.

Neither is it necessary to suspend navigation.

The summit level, which is 16 feet above mean low water, is surmounted by two locks, one at Delaware City of 6 feet on the east, to overcome the tides, and another at St. Georges of 10 feet lift to reach the upper level, while the entire lift is

comprehended in a single lock at Chesapeake City on the western end, where a reservoir serves to save half of the water required for lockage. The deficiency in the supply is furnished by two large engines which lift the tidal water from Back Creek by means of a large bucket wheel.

The auxiliary works consist of the usual bridges, reservoirs, drains, wiers, siphons, locks, buildings, &c., which, with the



Swing bridge at Summit (Buck's)

excavations and enlargements, are estimated to cost about \$5,000,000, exclusive of the franchises.

TRAFFIC.

On the present limited draught of ten feet the enormous tonnage of the two bays cannot use this route and is compelled to go outside, involving great loss of time, risk and expense. The official reports of the U. S. Engineers show that there are about 50,000,000 registered tons of commerce in the waters immediately tributary to the Chesapeake and Delaware Bays, and of this only about 700,000 freight tons can use the canal. If it were deepened to 20 feet even, then 75 per cent. of the

vessels could pass through, and many of them would doubtless soon do so if there were no obstructing tolls. In this case there would be an enormous traffic, while the railroads would



Three oyster sloops in St. George's Lock.

be relieved of the bulky freights at the nearest seaports and be enabled to utilize their rolling stock to much better advantage not only because of the shorter haul but because of the higher class freights carried.

The precedent furnished by the Sault Canal since its several arguments should suffice to show that the commerce grows faster than the Government can provide facilities and that absolutely no interests are injured thereby.

If the railroads and the people fully appreciated the benefits to be derived from a segregation of the bulky freights, wherever possible, from overland carriage, the conditions of traffic would be greatly improved for the good of all interests. To effect this result, opposition to waterway legislation must be removed and a far more comprehensive system be inaugurated for the conduct of these works on a broad basis, by dividing the country into districts based upon the drainage systems, and appointing permanent officials, with sufficient authority to conduct the local improvements, but at the same time giving every possible latitude to all private and corporate efforts to make improvements at their own cost and risk, as has been done so successfully in the rail and common road systems of our country.

